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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/807,808

03/23/2004

Forrest L. Williams

21644

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20551

7590

11/14/2005

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EXAMINER

KIANNI, KAVEH C

ART UNIT

PAPER NUMBER

2883

DATE MAILED: 11/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/807,808

Applicant(s)

WILLIAMS ET AL.

Examiner

Kianni C. Kaveh

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2883

AM

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) 20-36 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 13, 14 and 16-19 is/are rejected.
- 7) ☒ Claim(s) 7-12 and 15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 5.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.



DETAILED ACTION

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-26, drawn to a tuning and isolating device for a tunable fiber optic component, classified in class 385, subclass 013.
- II. Claims 27-36, drawn to a method of tuning the optical frequency of a fiber optic component with a fine tuning range as well as a coarse tuning range, classified in class 385, subclass 4.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case invention I can be practice a predetermined tuning range than that of coarse and/or fine tuning ranges and/or with or without temperature variation that is implemented in steps of processes of invention II.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

This application contains claims directed to the following patentably distinct species of the claimed invention:

Group 1A, claims 1-19 directed to a fiber optic tension structure including a tunable fiber optic component; Group 1B, claims 20-24 directed to including a thermally

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conductive acoustic damping material and a thermal control device for tuning optic component; Group 1C, claims 25-26 directed to including fiber optic tension structure having at least opposing ends.

Group 2A, claim 27 directed to including a method of tuning range than that of coarse and/or fine tuning ranges; Group 2B, claim 28-32 directed to including a method of compensating for variation in an optical system; Group 2C, claims 33-35 directed to including a method of making a tunable FO component by placing FO component within a tensioning structure; Group 2D, claim 36 directed to including a method of making a tunable FO component by placing FO component within acoustic damping, thermally conductive material.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, none of the claims are generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims

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are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

During a telephone conversation with Mr. North on 10/18/05 a provisional election was made without traverse to prosecute the invention of Group 1A, claims 1-19. Affirmation of this election must be made by applicant in replying to this Office action. Claims 20-36 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Allowable Subject Matter

Claims 7-12 and 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 7-12 are allowable because the prior art of record, taken alone or in combination, fails to disclose or render obvious a) an inner electrode located on an inner surface of the fiber optic tensioning structure; and b) an outer electrode located on an outer surface of the fiber optic tensioning structure where the inner and outer electrodes are configured to apply an electrical potential radially to the fiber optic tensioning structure in combination with the rest of the limitations of the base claim.

Claim 15 is allowable because the prior art of record, taken alone or in combination, fails to disclose or render obvious wherein the fiber optic component comprises a conductive jacket used to provide electrical connection to the tensioning structure in combination with the rest of the limitations of the base claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly

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owned at the time any inventions covered therein were made absent any evidence to the contrary.

Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-6 and 13-14 and 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fernald et al. (US 6490931).

Regarding claims 1-3, Fernald teaches a tuning and isolating support device for a tunable fiber optic component (shown in at least fig. 1, see abstract) and comprising: a) a fiber optic tensioning structure 8 having at least opposing ends configured to rigidly attach to and along a common longitudinal axis with the tunable fiber optical component 12 (see at least col. 1, last paraag.) and formed of an electrically-active (see detail desc, parag. 42), mechanically-responsive material such that changes in dimension along the longitudinal axis arising from an applied voltage to the tensioning structure yield corresponding dimensional changes in the fiber optic component (see detail desc, parag. 6, 27 wherein voltage is applied through electrical conducting device, see detail desc, parag. 42) to provide tunable adjustment of an optical frequency of the fiber optic component (see detail desc, parag. 35, wherein wavelength phase shift is optical/light frequency shift/change); and b) a liquid damping material encasing at least a portion of the tensioning structure and configured to minimize environmental noise effects on the fiber optic component (see detail desc, parag. 30, also 44);

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Fernand further teaches wherein the tensioning structure is fabricated from at least one section of a rigid material (see at least fig. 4, item 30).

However, Fernald does not explicitly state that the above liquid damping material is an acoustic damping material, and wherein the tensioning structure is fabricated from a piezoelectric material. Nevertheless, Fernald states that such liquid material is used to minimize vibration/noise effect to the optical element (see detail desc, parag. 30, also 44). It is obvious/well-known to those of ordinary skill in the art when the invention was made that the liquid such as oil used for damping vibration is/known-as an acoustic damping material for reducing vibration effect and that piezoelectric material for making tension structure is very well known in the art, and since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416; and since such material would provide a fiber optic pressure sensor with minimal creep (see col. 1, 3rd parag.).

Regarding claims 4-6, 13-14 and 16-19, Fernand further teaches wherein the tensioning structure further comprises a longitudinal bore configured to receive the fiber optic component (shown in fig. 1, item bore having through fiber 10); acoustic damping material disposed within the bore (shown in fig. 1, item bore having disposed with damping material see detail desc, parag. 30, also 44); at least one radially disposed aperture connecting the bore to an outer surface of the tensioning structure (shown in fig. 1, item rigid plug/connector, at the right, having a bore with fiber in the outer surface of tension structure); further comprising a plug positioned within the end

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of the tensioning structure and having a hole configured to receive and rigidly attach to the fiber optic component (shown in fig. 1, item rigid plug/connector, at the right, having a bore with fiber in the outer surface of tension structure); the tunable fiber optic component longitudinally mounted and rigidly attached to the tensioning structure (shown in fig. 1, at least item 12); wherein the fiber optic component is rigidly attached to the tensioning structure with clamp(s)/glue (shown in at least fig. 1 item fiber optic component is attached rigidly attached to the tensioning structure with obviously using glue or any such material(s) such as clamp(s) 240); wherein the fiber optic component is configured as a distributed feedback fiber laser mounted with an active region of the distributed feedback fiber laser positioned substantially between the ends of the tensioning structure wherein the distributed feedback fiber laser length is optimally selected to provide a particular mechanical natural frequency and optical linewidth (see detail desc, at least parag. 34-35).

Citation of Relevant Prior Art

Prior art made of record and not relied upon is considered pertinent to applicant's disclosure. In accordance with MPEP 707.05 the following references are pertinent in rejection of this application since they provide substantially the same information disclosure as this patent does. These references are:

Davis et al. 6563968 *At least this reference teaches a fiber optic element and piezo-eklectric material*

Kapany et al. 6480513

Engan et al. 5022732

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Weiegand 6510272

Pederson et al. 6449293

Franzen et al. 20030068127

These references are cited herein to show the relevance of the apparatus/methods taught within these references as prior art.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kianni C. Kaveh whose telephone number is 571-272-2417. The examiner can normally be reached on 9:30-19:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on 571-272-2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



**KAVEH KIANNI
PRIMARY EXAMINER**

November 2, 2005